

L 33264-65 BWT(m)/EMA(d)/T/EMP(t)/EMP(b) JD

ACCESSION NR: AP5005100

S/0129/65/000/002/0029/0035

AUTHOR: Pokluzurskiy, V. I.; Karpenko, G. V.

TITLE: Thermomechanical treatment of carbon structural steel

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 2, 1965, 29-35

TOPIC TAGS: thermomechanical treatment, steel structure, fatigue strength, carbon steel, structural steel, austenitization, plastic deformation, torsion testing / steel 45

ABSTRACT: The mechanical and electrochemical properties of steel 45 were investigated in relation to the austenitization temperature, heating rate, extent of deformation, and temperature of subsequent tempering. The fatigue strength and corrosion-fatigue strength were determined. High-temperature thermomechanical treatment consisted of the following: the specimens were heated at different rates to the austenitization temperature, deformed by torsion, and quenched in a stream of oil. To prevent recrystallization of the austenite, the time between the end of deformation and start of quenching did not exceed 1 sec. The thermomechanically treated specimens were tempered at various temperatures for 1 hr. Plastic deformation was determined by the magnitude of the specific angle of twist, characterizing the displacement of metal in planes perpendicular to the specimen axis per

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unit length, and by elongation of the surface fibers along the lines of the principal tensile stresses. Specimens were taken from the treated billets for static, dynamic, fatigue, and corrosion testing and for metallographic, carbide, and x-ray structural analyses. It was found that the tensile strength and hardness increased as deformation increased only up to a certain limit ( $\dot{\varphi} = 0.079$  rad/min). The degree of deformation did not affect tensile strength when the tempering temperature was raised to 450C. The effect of high-temperature thermomechanical treatment was evident only with low-temperature tempering, i.e., in steel with a martensite and troost-martensite structure. A decrease in the heating rate during austenitizing from 30 to 5 deg/sec. did not change the tensile strength or ductility, while increasing the rate to 200 deg/sec. increased the tensile strength, the maximal value being 250-260 kg/mm<sup>2</sup>, or 15-20 kg/mm<sup>2</sup> more than that obtained at a heating rate of 30 deg/sec. There was an optimal degree of deformation corresponding to a maximal increase in mechanical properties, but this was not constant and depended on the character and conditions of the tests. The conclusions of other authors, who negated the role of comminution of martensite crystals in the hardening of steel after high-temperature thermomechanical treatment, were confirmed by the authors of this article. It was revealed that high-temperature

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thermomechanical treatment was especially effective in steel with a martensite and troostite-martensite structure and that its use with plastic deformation by torsion is promising for shafts, rods, torsion springs, and other parts with the shape of bodies of revolution. Orig. art. has: 2 tables and 7 figures.

ASSOCIATION: Fiziko-mekhanicheskiy institut AN UkrSSR (Physicomechanical Institute AN UkrSSR)

SUBMITTED: 00

ENCL: 00

SUB CODE: 141

NO REF SOV: 007

OTHER: 002

Card 3/3

L 51523-65 EWT(d)/EWT(m)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(z)/  
EWP(b)/EWP(l)/EWA(g) Pf-4 KJW/JD/BN  
ACCESSION NR: AP5010788

UR/0021/65/000/004/0474/0477

AUTHOR: Vyval', I. P.; Romaniv, O. M. (Romaniv, O. N.); Karpenko, H. V. (Karpenko, G. V.) (Corresponding member AN UkrSSR)

TITLE: A new method of thermovibromechanical hardening of steel

SOURCE: AN UkrSSR. Dopovidi, no. 4, 1965, 474-477

TOPIC TAGS: steel hardening, vibration hardening, steel strength, hardness, plasticity

ABSTRACT: The authors investigated the mechanical behavior of steel after cyclic torsional deformation in the austenitic state and subsequent quenching. The investigations were made with medium-carbon structural steel 35Kh, using samples of 9 mm diameter and 60 mm length. The test equipment was described elsewhere (Voprosy mashinovedeniya i prochnosti v mashinostroyenii, v. 9, 134, 1964). The vibration frequency was close to the natural frequency of the operator-sample system (20-30 cps). The strength, hardness, and plasticity of the steel were measured as a function of the amplitude of the deformation, the number of deformation cycles, and the steel tempering conditions. The hardness and the plasticity exhibited a maximum in

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L 51533-65

ACCESSION NR: AP5010788

the range 100--300 cps as a function of the amplitude of the produced elastic-plastic deformation. <sup>2</sup> It is concluded that the thermovibromechanical hardening of steel can be used for certain machine parts and tools, especially those having the shape of bodies of revolution. Orig. art. has: 2 figures and 1 table

ASSOCIATION: Fizyko-mekhanichnyy instytut (Physicomechanical Institute)

SUBMITTED: 04Jan64

ENCL: 00

SUB CODE: MM, AB

NR REF SOV: 004

OTHER: 000

Card 2/2

L 1439-66 EWT(m)/EPF(c)/EWP(w)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/ETC(m) MJW/JD/WW/WB

ACCESSION NR: AP5022405

UR/0369/65/000/004/0477/0480

AUTHOR: Yefimenko, Yu. M.; Kuslitskiy, A. B.; Chaban, D. V.; Karpenko, G. V.;  
Movchan, B. A.

TITLE: Effect of the electron beam smelting on properties of the ShKh15 ball bearing steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, no. 4, 1965, 477-480

TOPIC TAGS: electron beam, ball bearing, smelting furnace

ABSTRACT: The effect of electron beam smelting on mechanical properties of the ShKh15 ball bearing steel was studied in order to compare the effectiveness of this technique with the effectiveness of the vacuum and slag smelting techniques. The electron beam smelting was conducted in a U-143 unit under  $5 \cdot 10^{-4}$ - $5 \cdot 10^{-3}$  mm Hg. As a result of this smelting treatment the oxygen content dropped from 0.0040 to 0.0007%, nitrogen from 0.007 to 0.0013%, hydrogen from 0.0001 to 0.00004%,  $SiO_2$  from 0.0008 to 0.0004%,  $Al_2O_3$  from 0.0270 to 0.0018%, FeO from 0.0007 to 0.0001%, and CaO from 0.0005 to 0.0001%. Electron beam smelted steel improved: resistance to cyclic deformation, corrosion resistance, and fatigue limit (33% increase).

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7  
The mechanical strength of ShKh15 steel ( $\sigma$  in kg/mm<sup>2</sup>) as a function of frequency of cyclic deformation (in millions of cycles)  $N$ , is shown in fig. 1 of the Enclosure. The corrosion resistance of ShKh15 steel in 53% H<sub>2</sub>SO<sub>4</sub> solution is shown in fig. 2 of the Enclosure. Orig. art. has: 3 figures, 5 tables.

ASSOCIATION: Institut electrosvar'ki im. Ye. O. Patona, AN UkrSSR, Kiev (Institute of Electric Welding, AN UkrSSR); Fiziko-mekhanicheskii institut, AN UkrSSR, L'vov (Physico-Mechanical Institute, AN UkrSSR) 14,55

SUBMITTED: 24Mar65

ENCL: 02

SUB CODE: MM

NO REF SOV: 004

OTHER: 000

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L 1439-66

ACCESSION NR: AP5022405

ENCLOSURE: 01

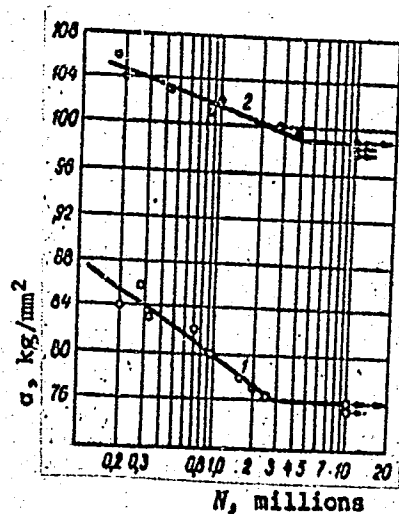


Fig. 1. 1--initial ShKh15 steel; 2--electron beam smelted ShKh15 steel.

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L 1439-66

ACCESSION NR: AP5022405

ENCLOSURE: 02

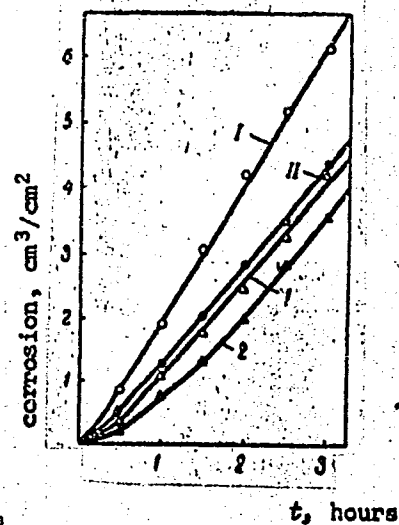


Fig. 2. 1--annealed steel;  
2--tempered steel; I, 1--un-  
treated steel; II, 2--electron  
beam smelted steel.

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SP

L 6985-66 EPF(c)/EWT(m)/EWP(z)/EWP(t)/EWA(d)/EWP(b)/ WB/JD/MW

ACC NR: AP5022406

SOURCE CODE: UR/0369/65/000/004/0481/0486

AUTHOR: Pogoretskiy, R. G.; Karpenko, G. V.

ORG: Lvov Physicomechanical Institute (Fiziko-mekhanicheskly institut AN UkrSSR, L'vov)

TITLE: Scale effect on the corrosion resistance of steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, no. 4, 1965, 481-486

TOPIC TAGS: metal scaling, corrosion rate, sea water corrosion

ABSTRACT: The effect of length to diameter ratio (from 0 to 9) on corrosion resistance in air and sea water (3% NaCl solution) was studied using 40Kh steel samples of 5 and 20 mm in diameter. The dependence of the 40Kh steel corrosion resistance in air and sea water upon the length to diameter ratio (l/d) of a sample is shown in fig. 1. The influence of the corrosive medium on the scale effect is shown in fig. 2. The dependence of the corrosion resistance upon the sample scale is explained in terms of simultaneous action of various factors which contribute to either strengthening or weakening of the sample outer layer. In the absence of such factors as

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L 6985-66

ACC NR: AP5022406

Fig. 1. A - is for  $\emptyset 5$  mm sample in air; B - is for  $\emptyset 20$  mm sample in air; C - is for  $\emptyset 20$  mm sample in sea water; D - is for  $\emptyset 5$  mm sample in sea water.

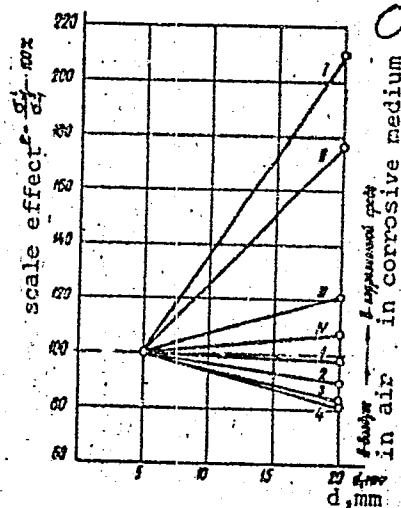
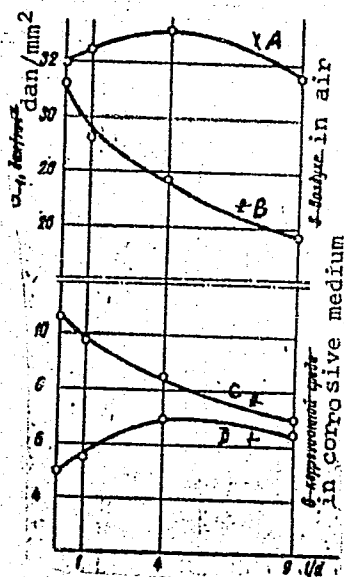


Fig. 2. 1, I - is for  $1/d = 0$ ; 2, II - is for  $1/d = 1$ ; 3, III - is for  $1/d = 4$ ; 4, IV - is for  $1/d = 9$ .

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ACC NR: AP5022406

cold working or residual strains, the scale effect on corrosion is negligible for samples having  $l/d > 4$ . Orig. art. has: 3 figures and 2 tables.

SUB CODE: MM/ SUBM DATE: 04Apr65/ ORIG REF: 009/ OTH REF: 001

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L 3590-66 EWT(m)/EWP(w)/EPP(c)/EWA(d)/I/EWP(t)/EWP(z)/EWP(b) LJP(c) MJW/JD/WE  
 ACCESSION NR: AP5022409 UR/0369/65/000/004/0499/0502

AUTHOR: Boltarovich, A. V.; Pikhmurskiy, V. I.; Gutman, E. M.; Meyerson, I. L.; 62  
 Karpenko, G. V. 44,55 44,55 44,55 44,55 59

TITLE: Corrosion fatigue of VT3-1 titanium alloy  
 44,55 18 18 44,55 77

SOURCE: Fiziko-khimicheskaya mekhanika materialov, no. 4, 1965, 499-502

TOPIC TAGS: titanium alloy, alloy corrosion, alloy corrosion resistance, alloy  
 fatigue strength, corrosion fatigue strength/VT3-1 titanium alloy

ABSTRACT: Unnotched and notched specimens of VT3-1 titanium [U.S. Ti155A] alloy  
 in the as-delivered condition (annealed for 1 hr at 870C, furnace cooled to 650C,  
 held for 1 hr, air cooled to room temperature) or after aging at 400-900C for 1 hr  
 or at 500C for 2-100 hr were tested for corrosion resistance in 40-78% H<sub>2</sub>SO<sub>4</sub> and  
 for fatigue behavior in air or in a 3% solution of NaCl. The alloy aged at 700C  
 had the highest and the alloy aged at 800-900C had the lowest corrosion rate:  
 0.140 and 0.121 mm per year, respectively, compared with 0.124 mm per year for alloy  
 in the as-delivered condition. The highest corrosion rate results from the maximum  
 dispersion of the  $\beta$ -phase structure, which increases the active area of microscopic  
 galvanic pairs that cause corrosion. With aging at temperatures higher than 700C,

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ACCESSION NR: AP5022409

the structure components coagulate, thus decreasing the active area of microgalvanic pairs and, correspondingly, the corrosion rate. In isothermal aging, the corrosion rate increased with exposure time, e.g., at 500C from 0.123 to 0.140 mm per year for 2 and 100 hr, respectively. The corrosion incubation period of identically aged VT3-1 alloy increased with the exposure time and decreased with increasing acid concentration. The alloy had high corrosion rates at acid concentrations of 40—70 and 78% and a minimum rate at a 53% concentration. In fatigue and corrosion fatigue tests, unnotched and notched alloy specimens were subjected to rotating bend test at 40C in air ( $10^7$  cycles) and in humid air (97% humidity) and in a 3% NaCl solution ( $5 \cdot 10^7$  cycles). The test results (see Fig. 1 of Enclosure) showed that the alloy fatigue strength in air was 52 dan/mm<sup>2</sup>. Under the action of 3% NaCl solution, the conditional endurance limit continuously decreased to 48 dan/mm<sup>2</sup> at  $5 \cdot 10^7$  cycles. Aging at 500C for 2 hr had no effect on the endurance limit of the alloy in all investigated media. In corrosive media, the effect of stress concentrators on fatigue strength was negligible. Previous corrosion decreased the fatigue strength of VT3-1 alloy in air from 52 to 39.5 dan/mm<sup>2</sup>. In 3% NaCl solution, the conditional endurance limit stress at the  $5 \cdot 10^7$  cycle basis was 48 and 38 dan/mm<sup>2</sup> for virgin and precorroded specimens, respectively. The VT3-1 alloy appears to be a suitable material

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L 3590-66

ACCESSION NR: AP5022409

for parts working under stresses in aggressive media. Orig. art. has: 1 figure  
and 1 table. [MS]

ASSOCIATION: Fiziko-mekhanicheskiy institut AN UkrSSR, L'vov (Physicomechanical  
Institute, AN UkrSSR) -

SUBMITTED: 04Apr65

ENCL: 01

SUB CODE: MM

NO REF SOV: 005

OTHER: .000

ATD PRESS: 4114

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L 3590-66

ACCESSION NR: AP5022409

ENCLOSURE: 01

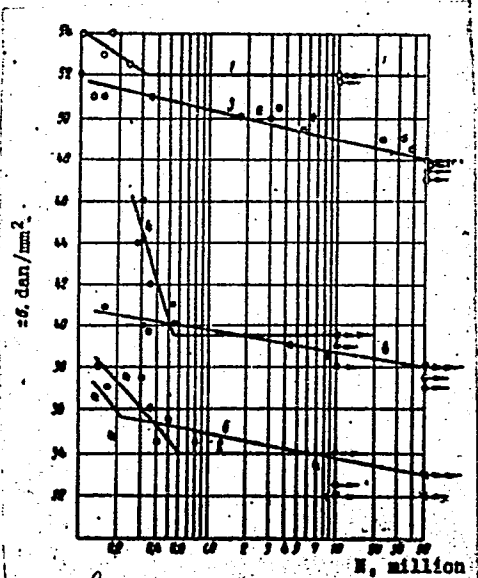


Fig. 1. Fatigue and corrosion-fatigue strength of VT3-1 titanium alloy

1a - Unnotched specimens; 2a - notched specimens; 3 - specimens tested in humid air at 40°C; 4c - pre-corroded specimens; 1, 2, 4 - tests in air; a, b, c - tests in a 3% NaCl solution.

Card

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L 14161-66 EWT(m)/EWP(b)/T/EWP(w)/EWP(t) JD/WB

ACC NR: AP5024784

SOURCE CODE: UR/0021/65/000/009/1179/1182

AUTHOR: Karpenko, I. V.; Babey, Yu. I.; Karpenko, H. V. -- Karpenko, G. V. (Corresponding member AN UkrSSR) 48

ORG: Physicomechanical Institute AN UkrSSR (Fizyko-mekhanichnyy instytut AN UkrSSR)

TITLE: The possibilities of increasing the corrosion fatigue strength of hardened steels 44.55.18 44.55.18

SOURCE: AN UkrRSR. Dopovid, no. 9, 1965, 1179-1182

TOPIC TAGS: corrosion resistant steel, stress corrosion, fatigue strength, hardening, low alloy steel

ABSTRACT: It was shown that the presence of a solid "white layer" on the surface of hardened steel samples increases their fatigue strength in air and particularly strongly (10 times) in a corrosion medium. Such high corrosion fatigue strength of ordinary medium carbon or slightly alloyed hardened steels with a "white layer" on their surface reveals the feasibility of their use in combined cyclic loads and aggressive media acting on machine parts. Orig. art. has: 2 figures and 1 table. [Based on author's abstract].

SUB CODE: 11/ SUBM DATE: 21Aug64

Card 1/1

L 21923-66 EWA(h)/EWT(m)/T/EWA(d)/EWP(w)/EWP(t) IJP(e) JD/DJ

ACC NR: AF6014622

SOURCE CODE: UR/0133/65/000/002/0151/0153

AUTHOR: Kuslitskiy, A. B.; Babey, Yu. I.; Karpenko, G. V.; Serebriyskiy, E. I.;  
Mizetskiy, V. L.; Borisov, A. Ya.

ORG: none

TITLE: Influence of nonmetallic inclusions and metal density on the fatigue strength  
of electroslag and vacuum remelted ShKh15 steel

SOURCE: Stal', no. 2, 1965, 151-153

TOPIC TAGS: nonmetallic inclusion, bearing steel, steel, electroslag melting,  
vacuum melting, density, steel microstructure, fatigue strength, annealing/ShKh15  
bearing steel

ABSTRACT: Very strict requirements have been set forth as to the purity of ShKh15  
ballbearing steel for manufacturing precision instrument bearings. These requirements  
can only be satisfied by special technology, e. g., by means of vacuum-arc and  
electroslag remelting (VAR and ESR). The degree of purity as to nonmetallic inclusions  
is not the same for different methods of remelting. The metal also differs in density.  
The authors of this paper investigated the relationship of both nonmetallic inclusions  
and density to fatigue strength of ShKh15 steel which was processed by six different  
methods: I and II-ESR+VAR (steel ShKh15P and ShKh15S); III-ESR (steel ShKh15Sh);  
IV--conventional melting in an open arc furnace (ShKh15); V--double VAR of a steel  
smelted from pure charge materials; and VI--double VAR of ordinary billets. As to

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UDC: 669.15

L 21923-66

ACC NR: AP6014622

3

chemical composition, the steel of all the melting methods conformed to GOST 801-60. Nonmetallic inclusions content was measured according to the scale of ChMTU 236-60. Density was measured by hydrostatic weighing of 20 samples from each of three melts (after quenching and low tempering). The samples were fatigue tested by the rotating-beam method using an NU machine at 50 cps. Samples for fatigue testing were turned from 18-20 mm annealed rods which were then heated to 840-850 C, oil quenched, and tempered at 150°C for 2 hours. The method used for evaluating contamination of the steels did not make it possible to establish a definite relationship between the content of individual forms of nonmetallic inclusions melted by the different methods and their fatigue limit, but, in general, the fatigue strength was lower for those steels which had a higher inclusion content. Of all the methods used it was found that electroslag remelting yields a denser microstructure and, consequently, a higher fatigue strength. Therefore, density of ballbearing steel should be considered as one of the most important factors of its quality and be rigidly controlled in the production of highly reliable bearings. Orig. art. has: 3 figures and 1 table. [JPRS]

SUB CODE: 11, 13, 20 / SUBM DATE: none / ORIG REF: 010 / OTH REF: 006

Card 2/2 nat

POGORETSKIY, R.G.; KARPENKO, G.V.

Cyclic strength of steel as dependent on the length of the specimens. Zav. lab. 31 no. 12:1497-1501 '65 (MIRA 19:1)

1. L'vovskiy fiziko-mekhanicheskiy institut AN UkrSSR.

L 37941-66 ENT(m)/ENP(w)/I/ENP(t)/ETI IJP(c) JD

ACC NR: AP6023448

SOURCE CODE: UR/0369/66/002/003/0336/0339

AUTHOR: Kuslitskiy, A. B.; Kreymerman, G. I.; Kokotaylo, I. V.; Starovoytov, Yu. A.; Karpenko, G. V.; Tkachev, V. I.

ORG: Physicomechanical Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR)

TITLE: Effect of metallurgical factors on the low-cycle fatigue in various media

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 3, 1966, 336-339

TOPIC TAGS: steel, low alloy steel, nickel containing steel, ~~vacuum-degassed steel~~, ~~low cycle fatigue~~, ~~steel fatigue strength~~, ~~steel fatigue life~~/12KhN3A steel

*steel structure*  
ABSTRACT: Low-alloy 12KhN3A structural steel, conventionally cast or vacuum degassed, was hot-rolled into 40 mm plates or 3 mm sheets, hardened and tempered to a tensile strength of 100 dan/mm<sup>2</sup>, and tested for fatigue strength in the air, in a 3% NaCl aqueous solution, and in the same solution with applied cathodic polarization, the latter to promote a hydrogen absorption. A constant-amplitude, symmetrical bending at a frequency of 0.8 cps was used in the tests. The test results showed that vacuum-degassed steel had a longer fatigue life in all the investigated media than the conventionally cast steel, especially in the tests in the NaCl solution with cathodic polarization. The embrittling effect of hydrogen and, correspondingly, the difference in the fatigue life increased with increasing amplitude. Longitudinal

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Card 2/2 11/11 P

L 10124-57 INT(m)/EWP(t)/ETI IJP(c) JD/GR

ACC NR: AP6020921

SOURCE CODE: UR/0369/66/002/002/0227/0227

AUTHORS: Vasilenko, I. I.; Vyval', I. P.; Karpenko, G. V.

ORG: Physical Mechanics Institute of the AN UkrSSR, L'vov (Fiziko-mekhanicheskii institut AN UkrSSR)

TITLE: Some data pertaining to the effects of heat treatment on the corrosion cracking of carbon steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 2, 1966, 227

TOPIC TAGS: stress corrosion, corrosion resistance, metal property, steel/ 40Kh steel

ABSTRACT: The effects of surface heat treatment with high frequency current (HFC) on the surface corrosion cracking of 40Kh steel were investigated, and the results are very briefly reported. It was found that HFC surface hardening increased the static corrosion resistance (in 20%  $H_2SO_4$ , 100 hours) to 66 dynes/mm<sup>2</sup>, i.e., twice that obtained for volume hardening of the specimens. The most effective surface treatment was found to be volume hardening and annealing (at 200C to HRC = 48--50) of the specimen followed by HFC surface annealing (to HRC = 27--30). The static corrosion strength of these specimens reached 115--120 dynes/mm<sup>2</sup>.

SUB CODE: 11/ SUBM DATE: 03Aug65/ ORIG REF: 002

Card 1/1 Lm

mechanical testing. ... analysis made it possible to calculate the length of the time or action and the concentration of the medium at which equal mechanical characteristics were ob-

Card 1/2



ACC NR: AP7007074

tained for samples of different diameters. The calculated data were confirmed by experimental results. Orig. art. has: 1 figure and 2 formulas. [JPRS: 39,658]

Card 2/2

ACC NR: AP6029685

(A)

SOURCE CODE: UR/0369/66/002/004/0441/0449

AUTHOR: Mindyuk, A. K.; Gutman, E. M.; Karpenko, G. V.

ORG: Physics-Engineering Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskii institut AN UkrSSR)

TITLE: The role of organic inhibitors in selective inhibition of the processes of corrosion and hydrogen absorption of steel in sulfuric acid

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 4, 1966, 441-449

TOPIC TAGS: organic inhibitor, steel corrosion, corrosion inhibitor, corrosion protection

ABSTRACT: The following acid corrosion inhibitors were tested: thiourea, KPI-2 (monomethylol-thiourea), KKh-2, N-phenyl-3-oxypyridine chloride, PB-8/2, BA-6, KPI-1 (N-decyl-3-oxypyridine chloride), APB (alkyl-pyridine bromide), ChM (R), PB-5, AGMIB (alkyl-hexamethylene-imine bromide), I-1-A, N-decyl-pyridine chloride, cetyl-pyridine chloride, katapin A, katapin K, gelatin, urotropin and formaldehyde. The concentration of inhibitors in 6N H<sub>2</sub>SO<sub>4</sub> was 1.5 g/l. The experiments were performed at 30±0.5C. Construction steel type 30 Kh was tested after quenching from 850C in oil with subsequent low temperature tempering (150C, 2 hours). The experimental results showed that all the inhibitors have protective properties, which may change with time. Anion and molecular adsorption were found to play a determining role in the effectiveness of the inhibitors. The mechanism of corrosion is discussed at length, and the

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ACC NR: AP6029685

protective action of the organic inhibitors is explained primarily by retardation of the anode reaction by screening anode sectors from the action of the corrosion-active  $\text{SO}_4^{2-}$  ion and polar water molecules. The various inhibitors were found to have different effects as to retarding the penetration of hydrogen. The least retardation was found for gelatin, the greatest for KPI-1. The inhibitor KPI-2 was least effective in resisting hydrogen absorption, BA-6 most effective. The opposite is true of these two inhibitors with regard to corrosion resistance. Engineer Ye. I. Svist and Junior Scientific Worker O. P. Savitskaya took part in the experiments. Orig. art. has: 2 tables and 3 figures.

SUB CODE: 11/ SUBM DATE: 20Feb66/ ORIG REF: 025/ OTH REF: 006

Card 2/2

ACC NR: AM6027007

Monograph

UR/

(*Herend Scientist UkrSSR; Professor*)

Karpenko, Georgiy Vladimirovich; Babey, Yuliy Ivanovich; Karpenko, Illirik Vital'yevich; Gutman, Emmanuil Markovich

Strengthening of steel by machining (Uprochneniye stali mekhanicheskoy obrabotki) Kiev, Naukova dumka, 1966. 201 p. illus., biblio. (At head of title: Akademiya nauk Ukrainskoy SSR. Fiziko-mekhanicheskii institut) 2700 copies printed.

TOPIC TAGS: fatigue strength, metal cutting, ~~metal hardening~~, metal machining, metal stress, ~~surface hardening~~, ~~mechanical metal cutting~~, fatigue test, corrosion resistance, corrosion resistant steel, *mechanical heat treatment, rupture strength, steel property*

PURPOSE AND COVERAGE: This book is intended for scientific and engineering personnel working on the strength of machine part. The authors discuss the effect of several methods of machining on the physicomachanical and electrochemical properties of steel. They show that a particular combination of thermal and mechanical treatment, which results in a solid white layer in the surface layers of steel parts, effectively increases the fatigue strength, particularly the corrosion-fatigue strength (10—15 times), of machine parts, as well as their stress-rupture strength in operation under neutrally corrosive conditions. The findings presented are based on

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ACC NR: AM6027007

studies made at the Physico-Mechanical Institute of the Academy of Sciences, Ukrainian SSR at L'vov during the last several years. Several methods developed at the Institute during the study are described in detail. The results of the study are summarized at the end of the book. There are 111 references of which 92 are Russian.

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SUB CODE: 11/ SUBM DATE: 12Feb66/ ORIG REF: 092/ OTH REF: 019

Card 2/2

ACC NR: AP7004183

(N)

SOURCE CODE: UR/0369/66/002/006/0661/0663

AUTHOR: Pokhmurskiy, V. I.; Boltarovich, A. V.; Shved, M. M.; Karpenko, G. V.

ORG: Physicomechanical Institute, Academy of Sciences, UkrSSR, L'vov (Fiziko-mekhanicheskii institut AN UkrSSR)

TITLE: Effectiveness of surface strain hardening in increasing the fatigue and corrosion-fatigue strength of some stainless steels

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 6, 1966, 661-663

TOPIC TAGS: <sup>steel property,</sup> strain hardening, stainless steel, martensitic <sup>steel,</sup> ferritic ~~stainless~~ steel, austenitic ~~martensitic stainless~~ steel, precipitation hardening, <sup>fatigue strength,</sup> ~~strain hardened stainless~~ steel, Kh17N2 stainless steel, Kh17N5M3 stainless steel <sup>corrosion</sup>

ABSTRACT:

Specimens of martensitic-ferritic Kh17N2 stainless steel were annealed at 1000C, oil quenched and tempered at 580C; specimens of precipitation-hardenable Kh17N5M3 stainless steel were annealed at 950C, air cooled, refrigerated at -70C, and aged at 450C. The heat-treated specimens were cold rolled to determine the effect of surface strain hardening on the fatigue and corrosion-fatigue strengths. It was found that the fatigue strength of Kh17N2 steel increases slightly (about 10%) with increased pressure of rolling and reaches its maximum at a pressure of about 50 dan. Increasing the pressure to 100 dan caused a sharp decrease in fatigue strength due to peeling and

Card 1/2

UDC: none

ACC NR: AP7004183

laminating of the surface. The rolling pressure magnitude has a similar effect on the corrosion-fatigue strength, which was maximum at about 65 dan. Cold rolling of Kh17N5M3 steel with 100 dan of pressure increases the fatigue strength by 30%, the corrosion-fatigue strength by more than 2.5 times, and the rupture life under high stresses 30—50 times. It is concluded that surface strain hardening is not very effective in increasing the fatigue strength of Kh17N2 steel and high rolling pressures even have a harmful effect. However, this method is very effective for increasing the fatigue strength and, particularly, the corrosion-fatigue strength of Kh17N5M3 steel, in which the strengthening effect increases with increasing rolling pressure. Orig. art. has: 3 figures and 1 table. [TD]

SUB CODE: 11, 13/ SUBM DATE: 14Aug66/ ORIG REF: 007/ ATD PRESS: 5115

Card 2/2



KARPENKO, I.

One billion boxes. Izobr. i rats. no.8:10 Ag '61. (MIRA 14:9)

1. Nachal'nik nauchno-issledovatel'skiy laboratorii tary  
Mosgorsovnarkhoza.

(Boxes)



YUSUFOVICH, D.Yo.; KARPENKO, I.A.

Your working place. Mashinostroitel' no.8:10-12 Apr '65.  
(MIRA 18:21)

L 14965-63

BWP(q)/EWT(m)/BDS AFFTC/ASD JD  
ACCESSION NR: AP3004266

5/0128/63/000/007/0005/0006

AUTHORS: Vasilevskiy, Kh. G.; Karpenko, I. I.

TITLE: Refining aluminum alloys with argon

SOURCE: Liteynoye proizvodstvo, no. 7, 1963, 5-6

TOPIC TAGS: aluminum alloy refining, argon, mechanical property, porosity, heat treatment

ABSTRACT: Studies on diminishing the gas and nonmetallic inclusions by passing argon through molten AL9 alloy were conducted. This was done because present methods of refining aluminum with chlorine salts do not always produce satisfactory results and also pollute the air in poorly ventilated shops. Samples of metal were tested for their mechanical properties and were examined microscopically by the x-ray method and spectroscopically. It was found that chemical composition of the metal was not affected significantly, and that its gas pores were substantially reduced. When argon was blown at 740-750C for 5 to 10 minutes, mechanical properties were improved, but they remained constant after blowing for longer periods. Similar results were obtained at 700-710C. Simultaneously conducted heat-treatment tests showed that AL9 refined with argon attained desirable properties in less than the 3 hours presently allotted to the process. It is recommended that AL9 be blown

Card 1/2

L 14965-63

ACCESSION NR: AP3004266

with argon for 8-10 minutes at 700-710C and that its heat-treatment time be reduced to 2 hours. Orig. art. has: 4 tables. *12*

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 08Aug63

ENCL: 00

SUB CODE: ML

NO REF SOV: 000

OTHER: 000

Card 2/2

DEMIRKHANOV, R.A.; GUTKIN, T.I.; SAMADASHVILI, O.A.; KARPENKO, I.K.

Mass measurements of tin and antimony isotopes. Izv. AN SSSR.  
Ser. fiz. 25 no.7:871-873 J1 '61. (MIRA 14:7)  
(Mass spectrometry) (Tin--Isotopes)  
(Antimony--Isotopes)

KARPENKO, F. K.

21.530072014/023, 1/32

RTT  
3/130/60 000/006/010/028  
20127444  
AUTHORS: Shyutse, V., Demikhov, R.A., Gutkin, T.I.,  
Samedashvili, O.A. and Karpenko, F.K.  
TITLE: A Double Focusing Mass-Spectrograph for the Measurement  
of the Masses of Isotopes

PERIODICAL: Priroda 1 tekhnika shapersants, 1960, No. 1, pp. 91-98  
TEXT: A description is given of a double-focusing mass spectrograph in which the double focusing condition is obeyed for all mass numbers. The principal ion deflection parameters are as follows: ion deflection angle in the electric field 50°, deflection angle in the magnetic field 90°, radius of curvature in the electric field 51 cm. Owing to large linear dimensions, high stability of deflecting fields and accurate adjustment, a resolution of 120000 was achieved. The corresponding linear dimensions of the spectrograph are: length of mass range between 0.15 and 2.25 m. A permanent magnet is employed so that the magnetic field is 1.5 to 2 k. The dispersion per 1% whole mass range. The spectrograph is essentially of the Mattauch type, as indicated by Fig. 1, where 1 is the ion source, 2 is a cylindrical condenser, 3 is the magnet, 4 is a vacuum

valve, 5 is the input slit, 6 is a vacuum-tight screen which also serves as the ion current receiver, 7 are slits, 8 is a Faraday cylinder, 9 is a magnetic field, 10 is an ion-optical image converter with a quartz light slit, 11 is an ion-optical image converter, 12 are diffusion pumps, and 13 is the photoelectric tube. The length of the photographic plate is 400 mm. The input slit is at a distance of 160 mm from the boundary of the electric field and the distance between the electric and the magnetic fields is 560 mm. The ion source is in the form of a water-cooled gas discharge tube. With an anode voltage of 50 kV and an anode-cathode potential difference of 25 kV, the discharge current was 10 to 5 mA. The accelerating electrode is earthed and the general arrangement of the electrodes is indicated in Fig. 3. The anode is in the form of a copper cylinder with a closed end and a circular aperture drilled through it. The cathode is in the form of a steel disk, having a channel of 0.5 mm in diameter and 8 mm long. The flux of slow ions

leaving this channel is accelerated by a third electrode in the form of a truncated cone and having a 1 mm diameter aperture. The position of the anode can be varied relative to the cathode. The magnet is such that fields up to 11000 Gs can be produced in a 4 mm gap; it is a permanent magnet with Arco-iron poles. The use of a permanent magnet ensures a high degree of uniformity ( $\Delta H/H \sim 10^{-7}$ ). In order to reduce the effect of the fringe field, a special magnetic slit made of high permeability material is used (9). Acknowledgments are expressed to V.P. Molodtsov and P. S. Brostyuk for the design and to V.P. Molodtsov and P. S. Brostyuk for practical assistance. There are 7 figures and 17 references: 1 Soviet and 16 non-Soviet.

SUBMITTED: May 16, 1959

CH-70-44



ANDRU'YEV, V.S.; DEMCHENKO, I.F.; KARSENKO, I.N.; KHRAPCHENKO, O.P.

Treatment and prophylaxis in the infestation of pigs with leeches.  
Veterinariia 39 no.7:60 J1 '62. (MIRA 18:1)

1. L'vovskaya stantsiya rybovodstva.

KARPENKO, I.M.; IVASIK, V.M.; KULAKIVS'KA, O.P.

Effect of low water temperatures on the wintering of young-of-the-year  
carp. Nauk.zap.L'viv.nauk.pryrod.muz.AN URSR 4:97-107 '55.(MLRA 9:9)  
(Carp)

KARPENKO, I.M.

Eliminating the hemorrhagic septicemia of carp by summer drainage  
and sanitary treatment of ponds on fish farms of the Lvov  
Fishery Trust. Trudy sov.Ikht.kom. no.9:43-48 '59.  
(MIRA 13:5)

1. Nauchno-issledovatel'skiy institut prudovogo i ozerno-  
rechnogo rybnogo khozyaystva USSR.  
(Ukraine--Carp--Diseases and pests) (Fish ponds)

AVDOS'EV, V. S., DEMCHENKO, I. F., KARPENKO, I. M. and KULAKOVSKAYA, O. P. [L'vov  
Station of Fish Farming]

"Treatment and measures for prophylaxis of pikes parasitized by leeches"

Veterinariya, vol. 39, no. 7, July 1962 pp. 60

Karpenko, I. S.

(4D) Tannin substances of *Leonurus cardiaca*. I. S. Karpenko and G. P. Alekseeva. *Novye Lekarny. Russk. 3941, 228* *Lekarna. Preparaty i Primenenie* (Tomsk) 4, 47-9 (1963); *Referat. Zhur. Khim., Biol. Khim.* 1953, No. 8409. — Two methods were used in the detn. of tannin substances (I) in flower, leaves, and stems of *L. cardiaca* (II): (a) the standard method and (b) the pptn. with Cu acetate. The content of I in flowers and leaves is practically the same; it is 2.5-3.5 times less in the stems. Phloroglucinol and polyphenol detns. were made also. II contains pyrogallol and pyrocatechol groups, but no polyphenols. Tests with frogs showed I and H<sub>2</sub>O-extrd. nontannin substances of II to possess bioactive properties. B. S. Levine.

①

Karpenko, I. S.

The volatile oil of *Chenopodium ambrosioides* cultivated in the city of Tomsk. T. A. Kazachkova and I. S. Karpenko. *Novye Lekarsv. Rasteniya Sibiri, ikh Lekovnye Preparaty i Primenenie* (Tomsk) 4, 146-7 (1953); *Referat. Zhur. Khim., Biol. Khim.* 1953, No. 12570. —The leaves yielded 0.78% and the stems 0.13% of volatile oil. The ascaridol content was 23.3%. B. S. Levine

USSR / Cultivated Plants. Technical, Oleaceous, Sugar Bearing  
Plants.

M-6

Abs Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58695

Author : Karpenko, I. S.; Kachayeva, Z. F.

Inst : Tomsk State Pedagogical Institute

Title : Experimental Cultivation of Ethiopian Crambe in  
Tomsk

Orig Pub : Uch. zap. Tomskiy gos. ped. in-t., 1956, 15, 437-451

Abstract : This is a brief review and results of work carried  
out in the agrosector of the Tomsk botanical garden  
and at the Tomsk zonal station. It was established  
that the soil-climatic conditions of Tomsk are  
appropriate for the cultivation of Ethiopian crambe.  
The yield of seeds was 12-50 cwt/ha. The seeds contain  
30-44.5% of oil, corresponding in terms of its physico-  
chemical properties to the oil, obtained from crambe

Card 1/2

120

USSR / Cultivated Plants. Technical, Oleaceous. Sugar Bearing  
Plants.

M-6

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000720820011-

Abs Jour : Ref Zhur - Biologiya, No 13, 1958, No. 58695

in the basic regions of cultivation of this crop.  
The net weight of the seeds was normal. It increased  
in the case of earlier sowing periods. The vegetation  
period fluctuates between 91 and 115 days, depending  
on the period of sowing and meteorological conditions.  
Crambe grows slowly until the advent of the budding  
phase (daily increment of not more than 0.5 cm).  
It grows very rapidly during the periods of budding,  
blooming and fruit formation (increment of 1.5-4.6 cm  
per day). The growth slows up considerably during the  
ripening period. -- N. N. Konstantinov

Card 2/2

L 23065-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/EWP(b) JD

ACCESSION NR: AT4049949

S/2723/64/000/003/0135/0142

AUTHOR: Karpenko, I. V.; Babey, Yu. I.

TITLE: Effects of finishing on the fatigue strength of hardened steel

SOURCE: AN UkrSSR. Fiziko-mekhanicheskiy Institut. Vliyaniye rabochikh sred na svoystva materialov, no. 3, 1964, 135-142

TOPIC TAGS: steel fatigue strength, hardened steel, surface finish, steel polishing, fine cutting

ABSTRACT: Earlier studies have shown (G. V. Karpenko, Vliyaniye mekhanicheskoy obrabotki na prochnost' i vyznoslivost' stali, K. Mashgiz, 1959) that the fatigue strength of steel, especially under operating conditions, is affected to a considerable degree by the mechanical processing of the surface of the steel parts. However, no data are yet known about the effect of finishing and the processing preceding the finishing of hardened steel on the fatigue strength in air and in corrosive media. Consequently, the authors investigated the effects of polishing and fine cutting on the fatigue strength of 40Kh troostite-martensite hardened steel in air and in 3% aqueous NaCl. The basis for the fatigue test was  $10^7$  cycles in air and  $2 \cdot 10^7$  cycles in the NaCl solution. The results showed that polishing of hardened steels after fine cutting produces properties related to the

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L 23065-65

ACCESSION NR: AT4049849

technological inheritance from the preceding mechanical processing. The findings are summarized in Table 1 of the Enclosure. They emphasize the importance of the general "white" layer (due to fine cutting) for the improvement in fatigue strength of hardened steel parts. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 01

SUB CODE: MM

NO REF SOV: 003

OTHER: 000

Card 2/3

L 40901-65 EWT(m)/EPF(c)/ENA/T/ENP(c)/ENP(z)/ENP(b) MJM/JD/WB

ACCESSION NR: AP5009282

8/0369/65/001/001/0054/0059

AUTHOR: Karpenko, I.V.

TITLE: Use of a white nonetchable layer for increasing the corrosion-fatigue strength of steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 1, 1965, 54-59

TOPIC TAGS: steel corrosion, steel fatigue, residual stress, corrosion resistance, fatigue strength, hardened steel, white nonetchable layer, steel hardness/40 Kh steel, ShKh15 steel

ABSTRACT: The author studied the influence of continuous white nonetchable layers on the fatigue and corrosion-fatigue strength of 40Kh and ShKh15 steels; data on 40Kh are reported, the results being the same for ShKh15. Fatigue tests in air and in a corrosive medium (3% aqueous solution of NaCl) were carried out on specimens coated with continuous white layers formed by machining on a lathe, and specimens having the initial structure (without the white layer), obtained by grinding, were tested for comparison. The microhardness of both types of specimens was measured, and x-ray structural analysis was performed. Fatigue tests showed that specimens with the white layer had a fatigue limit in air that was 54.7% greater than that of the ground specimens without the white layer. Correspondingly, the corrosion fatigue strength of specimens with the white layer

card 1/2

L 40901-65

ACCESSION NR: AP5009282

was 10 times that of the ground specimens in 3% NaCl. Residual compressive stresses and the presence of the white layer are thought to be responsible for the great increase in the fatigue strength of hardened steels in air and in 3% NaCl. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: Khar'kovskiy politekhnicheskij institut (Khar'kov Polytechnic Institute)

SUBMITTED: 07Aug64

ENCL: 00

SUB CODE: MM

NO REF SOV: 010

OTHER: 000

  
Card 2/2

GUTMAN, F.M.; KARPENKO, I.V.; TRACHENKO, N.N.

Effect of the scale factor on the strength of metals in anodic dissolution, and the similarity condition. Fiz.-khim. mekh. mat. 1 no.1:85-89 '65. (MIRA 19:1)

1. Fiziko-mekhanicheskii institut AN UkrSSR, L'vov. Submitted September 15, 1964.

L 62535-65 EPP(c)/ENG(j)/EWP(z)/EWA(c)/EWT(m)/EWP(1)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t)  
 Pr-4/Fs-4 LJP(c) MJW/JD  
 ACCESSION NR: AP5012650 UR/0369/65/001/002/0167/0171 40

AUTHOR: Karpenko, I. V.; Vasilenko, I. I.; Karpenko, G. V. 39  
 3

TITLE: Corrosion cracking of quenched steel when there are unetchable white layers on its surface

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 2, 1965, 167-171

TOPIC TAGS: steel, corrosion resistance, steel corrosion, corrosion cracking

ABSTRACT: Corrosion cracking of steel is a phenomenon caused by the static fatigue which takes place when a corrosion medium and static stresses act simultaneously on the metal. In many corrosion media, the cracking of steel is due in large measure to hydrogen absorption by the metal. Quenched and low-temper steels are usually subject to corrosion cracking. Very hard white layers which cannot be etched may be formed on the surface of parts made from quenched steels during grinding under certain conditions. This paper describes an investigation of cracking of quenched steel with a white layer on its surface in acid agents which cause hydrogen static fatigue (20% solution  $H_2SO_4$ ) and in neutral agents (3% NaCl solution) in which anode processes prevail during corrosion. 40Kh steel, tempered to troostite-martensite

Card 1/2

L 62535-65

ACCESSION NR: AP5012650

(HRC = 49-52) was studied. It was found that the white layer on the surface of quenched and low-temper steels increases the resistance of the steels to corrosion cracking. Residual tensile stresses have a negative effect on the resistance of quenched steel to corrosion cracking. Residual compression stresses are favorable in these cases. Cathode processes are mainly responsible for corrosion in an acid medium. White layers may be recommended as protection against corrosion cracking of quenched and low-temper steel in corrosive neutral media, e.g. sea water. The white layer does not last long in corrosive acid media; therefore it cannot be used in protection against corrosion cracking in these conditions. Orig. art. has: 4 figures, 3 tables.

ASSOCIATION: FMI AN UkrSSR, Lvov

SUBMITTED: 18Dec64

ENCL: 00

SUB CODE: HM

NO REF SOV: 004

OTHER: 000

*KA*  
Card 2/2

L 62532-65 EPP(c)/EWP(z)/EWA(c)/EWT(m)/EWP(l)/EWP(b)/T/EWA(d)/EWP(t) NJW/JD/NB

ACCESSION NR: AP5012651

UR/0369/65/001/002/0172/0181

34  
33  
B

AUTHOR: Karpenko, I. V.; Gutman, E. M.; Mindyuk, A. K.

TITLE: The electrochemical properties and chemical resistance of the white layer

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 2, 1965, 172-181

TOPIC TAGS: white layer, electrochemistry, chemical resistance, corrosion resistance, steel, metal chemical property

ABSTRACT: A white layer is formed on the surface of steel in certain cases: during mechanical finishing operations, during electric-spark and electric-arc hardening, when there is friction, and also in the case of pulsed action by gases during explosive forming. This white layer is very difficult to etch in ordinary metallographic reagents. The white layer is a part of the base metal which undergoes structural and phase transformations. The density and uniformity of the layer depend to a great extent on how it is formed. In this article the electrolytic potential of various samples with white layers and the corrosion resistance of the white layer in various media are studied. Hypoeutectoid 40Kh steel and hypereutectoid ShKh15 steel are investigated. Metallographic analysis was done on white layers produced

Card 1/2



L 62532-65

ACCESSION NR: AP5012651

by various methods. Electrolytic potentials were measured in a 3% solution of NaCl (imitation sea water); an aqueous solution of 0.01% HCL + 0.02% H<sub>2</sub>O, with no hydrogen bubbles, which disturb the stability of the electrolytic potential; aqua regia; and a mixture of concentrated solutions of HCL and HNO<sub>3</sub> in 3.6:1 proportions. It was found that the white layer in all the investigated cases had a more positive electrode potential than the original metal. Samples with maximum thickness of the white layer had the most positive potential. Surface particles of a metal with white layer and without it form microcells and macrocells in which the white layer is the cathode. The white layer greatly increases the general corrosion resistance of steel under the test conditions. Attempts were made to explain the electrochemical properties of the white layer from X-ray structure and metallographic data analysis. It is suggested that there is a possible analogy between the protective electrochemical action of the white layer and the protective action of a loose cathode coating. Orig. art. has: 7 figures, 2 tables.

ASSOCIATION: FMI AN UkrSSR, Lvov

SUBMITTED: 08Dec64

ENCL: 00

SUB CODE: MM

NO REF SOV: 009

OTHER: 000

Card *2/2*



L 00993-66 EMT(m)/EWP(w)/EPF(c)/EWP(i)/EWA(d)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c)  
JD/JW/HW/WB

ACCESSION NR: AP5019666

UR/0369/65/001/003/0379/0380

AUTHOR: Karpenko, I. V.

TITLE: Effect of the white layer on the service life of steel parts in corrosive media

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 1, no. 3, 1965, 379-380

TOPIC TAGS: steel, thermomechanical treatment, steel thermomechanical treatment, steel corrosion, corrosion fatigue, corrosion fatigue resistance, corrosion fatigue inhibition,

ABSTRACT: In his report presented at a seminar on the physicochemical mechanics of materials, I. V. Karpenko proposed a special thermomechanical treatment to prolong the service life of steel parts operating in corrosive media. As a result of this treatment, a white layer is formed on the steel surface. This layer was found to increase the corrosion fatigue resistance of hardened steel by at least 10 times. Rupture strength of such a steel in sea water is also considerably higher than uncoated steel. An investigation showed that the white layer is thermodynamically more resistant to corrosive media than conventionally heat-treated steel, and that it consists of a mixture of residual austenite with finely dispersed martensite.

[ND]

Card 1/2

L 00993-66

ACCESSION NR: AP5019666

ASSOCIATION: Khar'kovskiy politekhnicheskii institut (Khar'kov Polytechnical Institute) 55

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

ATD PRESS: 4068

Card 2/2

L 14161-66 EWT(m)/EWP(b)/T/EWP(w)/EWP(t) JD/WB

ACC NR: AP5024784

SOURCE CODE: UR/0021/65/000/009/1179/1182

AUTHOR: Karpenko, I. V.; Babey, Yu. I.; Karpenko, H. V. -- Karpenko, <sup>48</sup>  
G. V. (Corresponding member AN UkrSSR) <sup>B</sup>

ORG: Physicomechanical Institute AN UkrSSR (Fizyko-mekhanichnyy  
instytut AN UkrSSR)

TITLE: The possibilities of increasing the corrosion fatigue strength  
of hardened steels <sup>44.55, 19</sup> <sup>44.55</sup> <sup>19</sup>

SOURCE: AN UkrRSR. Dopovidi, no. 9, 1965, 1179-1182

TOPIC TAGS: corrosion resistant steel, stress corrosion, fatigue  
strength, hardening, low alloy steel

ABSTRACT: It was shown that the presence of a solid "white layer"<sup>4</sup> on  
the surface of hardened steel samples increases their fatigue strength  
in air and particularly strongly (10 times) in a corrosion medium.  
Such high corrosion fatigue strength of ordinary medium carbon or  
slightly alloyed hardened steels with a "white layer" on their surface  
reveals the feasibility of their use in combined cyclic loads and  
aggressive media acting on machine parts. Orig. art. has: 2 figures  
and 1 table. [Based on author's abstract].

SUB CODE: 11/ SUBM DATE: 21Aug64

Card 1/1 <sup>2</sup>

L 18570-66 EWT(m)/T

ACC NR: AP6002430

SOURCE CODE: UR/0020/65/165/005/1101/1104

AUTHORS: Vol'kenshteyn, F. F.; Karpenko, I. V.

ORG: Institute of Physical Chemistry, Academy of Science SSSR (Institut fizicheskoy khimii Akademii nauk SSSR)

TITLE: Displacement of the adsorption equilibrium on the surface of a semiconductor due to illumination

SOURCE: AN SSSR. Doklady, v. 165, no. 5, 1965, 1101-1104

TOPIC TAGS: semiconductor theory, semiconductor research, semiconductor conductivity, photoeffect, gas adsorption, semiconductor

ABSTRACT: The authors attempt a theoretical treatment of the photoadsorption effect and present a discussion which is an extension of their previous work on the same topic (Kinetika i kataliz, 3, 72, 1962). The discussion is based on the following, explained by a model shown in Fig. 1, where A is the localized surface level of the chemisorbed particle, FF - Fermi level in the nonilluminated specimen, and all other quantities are defined as in F. F. Vol'kenshteyn (Kinetika i kataliz, 2, 481, 1961). On the basis of the proposed model, it is concluded

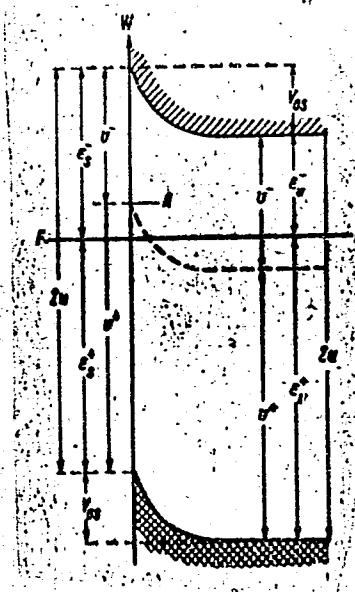
Card 1/3

UDC: 541.183.03

L 18570-66

ACC NR: AP6002430

Fig. 1. Schematic of the energy level distribution for the proposed model of the photoadsorption effect.



that there should exist a correlation between the photoadsorptive effect and the  
Card 2/3

L 18570-66

AGG NR: AP6002430

work function of the semiconductor surface. The equation for the inversion point of the photoadsorptive effect is derived as

$$\Phi = \Phi_M = y/b = I \exp (v \mp V_{os}),$$

where  $\phi$  is defined by

$$\phi = \frac{N - N_0}{N_0} = \frac{\Delta N}{N_0},$$

in which  $N$  and  $N_0$  are the surface concentrations of the chemisorbed particles in the presence and absence of illumination respectively.  $V_{os}$  is the work function,  $I$  is the light intensity, and  $v$  is defined in Fig. 1. It is stated that more experimental work is necessary before a conclusive test of the proposed theory for the photoadsorption effect can be made. This paper was presented by Academician M. M. Dubinin on 28 July 1965. Orig. art. has: 2 graphs and 11 equations.

SUB CODE: 20/ SUBM DATE: 26Jul65/ ORIG REF: 005/ OTH REF: 001

Card 3/3 *SW*

L 40305-66 ENT(d)/ENT(m)/ENP(w)/ENP(t)/ATI IJP(c) EM/JD

ACC NR: AP6009606

SOURCE CODE: UR/0369/66/002/001/0003/0009

AUTHORS: Karpenko, I. V.; Ryabov, B. F.; Lutsiv, M. F.; Babey, Yu. I.

ORG: Physico-Mechanical Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR)

TITLE: Method for determining axial residual stresses in metal surface layers 18

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 1, 1966, 3-9

TOPIC TAGS: stress distribution, metal stress, steel / 45 steel, 40Kh steel

ABSTRACT: A method for measuring residual axial stresses in the surface layers of solid cylindrical specimens is presented. It consists of measuring with resistance strain gages the deformations which result during continuous etching of a semi-cylindrical portion of the rod and relating these deformations to the residual stresses. Based on the equations proposed by I. A. Birger (Ostatochnyye napryazheniya, Mashgiz, 1963), an equation for the residual stresses as a function of deformation and etching depth is derived in the form

$$\sigma_{oct} = - \frac{E}{\left[ \frac{2(r-\delta_i) + \pi y_{\delta_i}}{l_{\delta_i}} l(\delta_i) - \frac{\pi}{F_{\delta_i}} \right] (r-\delta_i)} \frac{d\delta_i}{d\delta_i} + E \int_0^{\delta_i} A(\delta_{i-1}) \frac{d\delta_i}{d\delta_{i-1}} d\delta_{i-1}$$

Card 1/2

L 40305-66

ACC NR: AP6009606

where

$$\Delta_1 + \Delta_2 + \dots + \Delta_n = \delta_i$$

and

$$I_{\delta_i} = \frac{\pi}{8} [(r - \delta_i)^4 + r^4]; \quad F_{\delta_i} = \frac{\pi}{2} [(r - \delta_i)^2 + r^2];$$

$$y_{\delta_i} = \frac{4[(r - \delta_i)^2 - r^2]}{3\pi[(r - \delta_i)^2 + r^2]}.$$

The derivatives  $d\varepsilon/d\delta_i$  can be obtained from the experimental data, using parabolic approximations. The term

$$B = \frac{E}{\left[ \frac{2(r - \delta_i) + \pi y_{\delta_i}}{I_{\delta_i}} l(\delta_i) - \frac{\pi}{F_{\delta_i}} \right] (r - \delta_i)}.$$

can be constructed graphically to simplify the calculations. Sample curves of residual stress distributions in 20- and 150-mm diameter rods made of steels 45 and 40Kh are presented to demonstrate the procedure. Orig. art. has: 13 formulas and 4 figures.

SUB CODE: 11,20/ SUBM DATE: 21Sep65/ ORIG REF: 002

Card

ACC NR: AP6020686

APPROVED FOR RELEASE: 06/13/2000

SOURCE CODE: UR/0369/66/002/004/0450/0456

CIA-RDP86-00513R000720820011-

AUTHOR: Babey, Yu. I.; Vasilenko, I. I.; Karpenko, I. V.

ORG: Physics-Engineering Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskii institut AN UkrSSR); Physics-Technical Institute of Low Temperatures, AN UkrSSR, Khar'kov (Fiziko-tekhicheskii institut nizkikh temperatur, AN UkrSSR)

TITLE: The influence of some types of mechanical processing on the stress corrosion cracking of 40-Kh steel

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 4, 1966, 450-456

TOPIC TAGS: corrosion resistant steel, stress corrosion, thermal process, microgeometry

ABSTRACT: Results are presented from an investigation of the influence of the physical-mechanical state of the near-surface layers of metal and microgeometry of the surface of samples on their stress-corrosion cracking as a function of thermal and mechanical processing of the steel. The intensity and nature of the formation of fissures in the metal after these types of treatment is also studied. The studies were performed on steel oil-quenched from 850 C and tempered at 170, 320, 450, and 530 C for 2 hours. The stress-cracking tests were

Card 1/2

ACC NR: AP6020686



ACC NR: AM6027007

## Monograph

UR/

(Honored Scientist USSR; Professor)  
Karpenko, Georgiy Vladimirovich; Babey, Yuliy Ivanovich; Karpenko,  
Illirik Vital'yevich; Gutman, Emmanuil Markovich

Strengthening of steel by machining (Uprochneniye stali mekhanicheskoy obrabotki) Kiev, Naukova dumka, 1966. 201 p. illus., biblio. (At head of title: Akademiya nauk Ukrainskoy SSR, Fiziko-mekhanicheskii institut) 2700 copies printed.

TOPIC TAGS: fatigue strength, metal cutting, ~~metal hardening~~, metal machining, metal stress, ~~surface hardening~~, ~~mechanical metal cutting~~, fatigue test, corrosion resistance, corrosion resistant steel, *mechanical heat treatment, rupture strength, steel property*

PURPOSE AND COVERAGE: This book is intended for scientific and engineering personnel working on the strength of machine part. The authors discuss the effect of several methods of machining on the physicomachanical and electrochemical properties of steel. They show that a particular combination of thermal and mechanical treatment, which results in a solid white layer in the surface layers of steel parts, effectively increases the fatigue strength, particularly the corrosion-fatigue strength (10—15 times), of machine parts, as well as their stress-rupture strength in operation under neutrally corrosive conditions. The findings presented are based on

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ACC NR: AM6027007

studies made at the Physico-Mechanical Institute of the Academy of Sciences, Ukrainian SSR at L'vov during the last several years. Several methods developed at the Institute during the study are described in detail. The results of the study are summarized at the end of the book. There are 111 references of which 92 are Russian.

TABLE OF CONTENTS [abridged]:

Foreword --	3
INTRODUCTION --	5
Ch. I. Effect of cutting rates on the physicomachanical properties of the surface layers of steel --	10
Ch. II. Effect of cutting rates on the fatigue and corrosion-fatigue strength of steel and on its corrosion cracking --	131
Conclusion --	185
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SUB CODE: 11/ SUBM DATE: 12Feb66/ ORIG REF: 092/ OTH REF: 019

Card 2/2

KARPENKO, I.V., inzh.

Manufacturing water-resistant peat insulating boards. Torf. prom.  
36 no.7:19-20 '59. (MIRA 13:3)

1. Obukhovskaya fabrika "Torfoplit" Leningradskogo sovnarkhoza.  
(Peat)

BULGAKOV, V.N.; KARPENKO, I.V.

Numerical solution of the uniform equation of a toroidal shell.  
Sbor.trud.Lab.gidr.mash. no.9:89-93 '61. (MIRA 15:3)  
(Elastic plates and shells)

SHALIMOVA, K.V.; KARPENKO, I.V.

Optical absorption and internal photoelectric effect of cadmium sulfide.. Nauch.dokl.vys.shkoly; radiotekh. i elektron. no.2:233-242  
'58. (MIRA 12:1)

1. Kafedra poluprovodnikovyykh priborov Moskovskogo energeticheskogo instituta.

(Cadmium sulfide--Optical properties)

24(4)

SOV/162-58-3-24/26

AUTHORS: Shalimova, K.V., and Karpenko, I.V.

TITLE: The Influence of Cadmium on the Electrical, Optical and Photo-Electrical Properties of Cadmium Sulfide  
(O vliyani kadmiya na elektricheskiye, opticheskiye i photoelektricheskiye svoystva sul'fida kadmiya)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Radiotekhnika i elektronika, 1958, Nr 3, pp 176-183 (USSR)

ABSTRACT: The authors investigated the light and dark conductances of CdS which are affected by the stoichiometric excess of Cd atoms for establishing an additional control of the conclusions concerning the light absorption and photoconductance of CdS, found in the visible range of the spectrum. The optical absorption of CdS has different values, depending upon the content of free Cd atoms. Further, a photo effect arises as a result of an ionization of excess Cd atoms when absorbing the excitation light. The authors conducted three series of experiments during their investigation. The first series of experiments

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SOV/162-58-3-24/26

The Influence of Cadmium on the Electrical, Optical and Photo-Electrical Properties of Cadmium Sulfide

was made for the determination of the heat influence on the photoconductivity of CdS. The second series of experiments dealt with the influence of radiation on the magnitude of photo-conductivity of CdS, where-by a PRK-4 mercury lamp was used. The third series of experiments explained the influence of metallic cadmium in the CdS lattice on the electrical and optical properties of the latter. The authors established that the electric conductance of CdS increases uninterruptedly with an increase of the metallic Cd concentration in its lattice, while the photosensitivity rises initially and decreases thereafter. CdS films containing a small amount of excess Cd atoms have a great light conductance, but a low dark conductance. CdS films having a sufficiently high number of excess Cd atoms have a lower light conductance, but show a considerable dark conductance. There are

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SOV/162-58-3-24/26  
The Influence of Cadmium on the Electrical, Optical and Photo-  
Electrical Properties of Cadmium Sulfide

7 graphs, 1 table and 4 Soviet references.

ASSOCIATION: Kafedra poluprovodnikovych priborov Moskovskogo  
energeticheskogo instituta (Chair of Semicon-  
ductor devices of the Moscow Institute of Power  
Engineering)

SUBMITTED: June 7, 1958

Card 3/3



24.7400 (1055, 1160, 1454)

35063  
S/195/62/003/001/004/010  
E039/E136

AUTHORS: Vol'kenshteyn, F.F., and Karpenko, I.V.

TITLE: On the theory of the photoadsorption effect in  
semiconductors

PERIODICAL: Kinetika i kataliz, v.3, no.1, 1962, 72-80

TEXT: The exposure of semiconductors to light sometimes stimulates a change in the adsorptive capacity of the surface; in some cases there is an increase in adsorption and in others a decrease. The existing experimental data appear to be inconsistent, but in this paper a theory is advanced, based on the electronic theory of chemisorption, which explains these positive and negative adsorption effects. The concentrations corresponding to free electrons and holes in the surface of a semiconductor are represented by  $n_{os}$  and  $p_{os}$  in the absence of light and the corresponding changes in concentration stimulated by exposure to light are  $\Delta n_s$  and  $\Delta p_s$ . The authors use the expression:

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X

On the theory of the photoadsorption... S/195/62/003/001/004/010  
E039/E136 .

$$\gamma = \frac{\Delta n_s}{n_{os}} \cdot \frac{p_{os}}{\Delta p_s} \cdot \exp \left[ (\varepsilon - V_{os} + v)/kT \right] - 1 \quad (1)$$

where the meanings of the values  $\varepsilon$ ,  $V_{os}$  and  $v$  are evident from Fig.1, which represents an energy diagram for a semiconductor with a negatively charged surface. The line FF is the Fermi level in the non-illuminated condition.  $\Lambda$  is the local surface level (acceptor and donor) representing adsorption of particles. The sign of the photoadsorption effect depends on the sign of  $\gamma$ , and the problem reduces to a calculation of the quantities  $\Delta n_s$  and  $\Delta p_s$ . The final expressions obtained are:

$$\begin{aligned} \Delta n_s &= (I_o + j_s) \sqrt{\frac{\tau_i}{D_i}} \exp (-V_{os}/kT) \\ \Delta p_s &= (I_o + j_s) \sqrt{\frac{\tau_i}{D_i}} \exp (+V_{os}/kT) \end{aligned} \quad (18)$$

Card 2/5

On the theory of the photoadsorption... S/195/62/003/001/004/010  
E039/E136

where  $I_0$  is the intensity of the light. It is shown that the sign of  $\gamma$  is determined by the sign of  $\psi$  where

$$\psi = \varepsilon + V_{os} - v \quad (19)$$

Hence we have:

(a) For acceptor particles:

Positive effect (photoadsorption) if  $\psi < 0$ ,

Negative effect (photodesorption) if  $\psi > 0$ .

(b) For donor particles:

Positive effect (photoadsorption) if  $\psi > 0$ ,

Negative effect (photodesorption) if  $\psi < 0$ .

The results are discussed in detail and the theory compared with experimental data; in particular for the case of adsorption of oxygen on zinc oxide. The sign of the effect depends on the pressure, temperature and also the presence of excess zinc in the ZnO samples. There are 3 figures. X

Card 3/5

On the theory of the photoadsorption... S/195/62/003/001/004/010  
E039/E136

ASSOCIATION: Institut fizicheskoy khimii AN SSSR  
(Institute of Physical Chemistry, AS USSR)  
Moskovskiy gosudarstvennyy universitet im.  
M.V. Lomonosova  
(Moscow State University imeni M.V. Lomonosov)

SUBMITTED: September 28, 1961

X

Card 4/5

L 17927-63

EWI(1)/EWG(k)/EDS AFFTC/ASD/ESD-3/IJP(C) Pz-4 AT

ACCESSION NR: AT3002446

8/2935/62/000/000/0114/0127

65  
63

AUTHOR: Vol'kenshteyn, F. F.; Karpenko, I. V.

TITLE: Theory of photoadsorption effect on semiconductors<sup>21</sup> [Report at the Conference on Surface Properties of Semiconductors, Institute of Electrochemistry, AN SSSR, Moscow, 5-6 June 1961]

SOURCE: Poverkhnostnyye svoystva poluprovodnikov. Moscow, Izd-vo AN SSSR, 1962, 114-127.

TOPIC TAGS: semiconductor, semiconductor theory, photoadsorption effect

ABSTRACT: A further development is offered of the theory of photoadsorption effect (variation of adsorbability with illumination). Specifically, a criterion is established which determines the sign (plus-minus) of photoadsorption effect under various conditions: adsorbent and adsorbate nature, pressure, temperature, specimen prehistory, etc. The sign depends on the position of the Fermi level and on the degree of band bending. The theory is checked against the published experimental data obtained by F. Romero-Rossi, F. S. Stone, T. I. Barry, Y. Fujita, T. Kwan, A. N. Terenin, Y. P. Solonitzin, and others. Orig. art. has: 2 figures and 22 formulas.

ASSN: INSTITUTE OF PHYSICAL CHEMISTRY, AN SSSR; MOSCOW STATE UNIVERSITY.

Card 1/1

KARPENKO, K.L., inzhener.

Changes in the design of the D-181A concrete spreader. Avt.dor.  
19 no.1:28 Ja '56.

(MLRA 9:5)

(Road machinery)

KARPENKO, K. N.

PA 13/49T60

USSR/Medicine - Hemoglobin and Hemo-  
globin Compounds  
Medicine - Arsenic and Arsenic  
Compounds

May/Jun 48

"Problem of the Protective Role of Methemoglobin:  
I, Protective Role of Methemoglobin Against the  
Effect of Some Arsenic and Narcotic Compounds on  
Isolated Heart and Intestines," K. N. Karpenko, Chair  
of Toxicol, Mil Med Acad imeni S. M. Kirov, 7 $\frac{1}{2}$  pp

"Fiziol Zhur SSSR" Vol XXXIV, No 3

Reports experiments. Includes and discusses cardio-  
grams obtained. Favorable effect of methemoglobin is  
connected with absorption of poison through margin of  
the erythrocytes. ■■■

13/49T60

KARPENKO, K.N.

Modification on the gas content of blood in reflex stimulation of  
the respiratory tract. Fiziol.zh.SSSR 36 no.6:712-715 Nov-Dec 50.  
(CLML 20:6)

1. Department of Toxicology of the Military Medical Academy imeni  
S.M.Kirov.



KARPENKO, K. N.

USSR/Medicine - Toxic gases

Nov/Dec 51

"Changes in the Gas Composition of Blood Due to Reflex Action Produced by Irritation of the Respiratory Tract," K. N. Karpenko, Chair of Toxicol, MII Med Acad imeni S. M. Kirov

"Fiziol Zhur SSSR" Vol XXXVI, No 6, pp 712-715

Reflex disturbances of respiration and circulation as a result of irritation of the respiratory tract with  $\text{NH}_3$ ,  $\text{Cl}_2$ ,  $\text{COCl}_2$ , etc. (cf. K. N. Karpenko, "Tr Voyenno-Med Ak imeni S. M. Kirova" XLII, 157, 1947) result in hypoxemia and hypercapnia, which are particularly acute when the upper part of the

206T77

USSR/Medicine - Toxic gases (Contd)

Nov/Dec 51

respiratory tract is irritated. These conditions arise 1-1.5 min after irritation of the mucous membranes and persist for scores of minutes or even hours. Rapidly developing hypoxemia and hypercapnia form background for subsequent toxic process, which indicates necessity of therapeutic treatment with oxygen at the earliest moment.

206T77

L 27287-66

ACC NR: AP6016868

SOURCE CODE: UR/0219/65/060/010/0008/0011

AUTHOR: Chorayan, O. G.; Karpenko, L. D.

ORG: Laboratory of Biophysics, Rostov-on-Don University (Laboratoriya biofiziki Rostovskogo-na-Donu universiteta); Department of Human and Animal Physiology /headed by Professor A. B. Kogan/, Rostov-on-Don University (Kafedra fiziologii cheloveka i zhivotnykh Rostovskogo-na-Donu universiteta)

TITLE: Concerning the possible role of multiple rhythm guides in the giant neurons of invertebrates

SOURCE: Byulleten' eksperimental'noy biologii i meditsiny, v. 60, no. 10, 1965, 8-11

TOPIC TAGS: neuron, central nervous system, neurophysiology

ABSTRACT: Investigations were conducted to determine the biological significance of the multiple rhythm guides in the giant neurons of invertebrates. Preparations of the pharyngeal ganglion of the edible snail (*Helix pomatia* L.) and the sixth abdominal ganglion of a crayfish (*Astacus astacus*) were used in the experiments. The potentials from the separate neurons were conducted by glass microelectrodes filled with a mixture of a 2.5 molar solution of KCl and 0.5 molar solution of Na (CN). The tip of the recording microelectrode was marked. The impulse potentials were recorded on a "Diza" electromyograph. With the help of the microelectrodes it was possible to detect impulse po-

Card 1/2

UDC: 592-118.1

L 27287-66

ACC NR: AP6016868

entials ranging from potentials of basic small amplitudes to those of a high amplitude and positive character capable of penetrating neural membranes. By calculating these penetrations it was possible to determine the number of spontaneously active neurons. It was found that 1/10th of the total number of neurons in the pharyngeal ganglion of the snail and 1/14th of the neurons in the sixth ganglion of the abdomen in the crayfish are capable of basic impulse activity, that is, the discharge of impulse potentials in the absence of special stimuli. It was found also that in many cases the split impulse potentials of different amplitudes were recorded, indicating the presence of several rhythm guides in a single neuron. These are localized in different but limited portions of the soma. It is thought that the existence of multiple rhythm guides in a single neuron is of definite biological significance; in some unique manner it secures the high dependability of the functions of the central nervous system in invertebrates. Special stimuli (threshold and subthreshold) tend to disturb the regular succession activity of separate rhythm guides, modifying also the frequency of the action potentials. This paper was presented by Active Member AMN SSSR V. V. Parin. Orig. art. has: 3 figures. [JPRS]

SUB CODE: 06 / SUBM DATE: 08Jun64 / ORIG REF: 008 / OTH REF: 009

Card 2/2 ce

KARPENKO, L.D.

Structural functional correlations of the neurons of the  
subpharyngeal ganglion in snails *Helix pomatia* L. Fiziol.  
zhur. 51 no.10:1192-1198 O '65.

(MIRA 18:12)  
1. Kafedra fiziologii cheloveka i zhivotnykh Gosudarstvennogo  
universiteta, Rostov-na-Donu. Submitted March 6, 1964.

GHORAYAN, O.G.; KARPENKO, L.D.

Possible role of the plurality of rhythm guides in the giant  
neurons in invertebrates. Biul. eksp. biol. i med. 60 no. 10:  
8-11 0 '65 (MIRA 19:1)

1. Laboratoriya biofiziki i kafedra fiziologii cheloveka i zhi-  
votnykh (zav. - prof. A.B. Kogan) Rostovskogo-na-Donu universi-  
teta. Submitted June 8, 1964.

KARLENKO, L.D.

Immunoserological study of leukopenic states in various clinical  
hematological syndromes. Probl. gemat. i perel. krovi 9 no.7:18-23  
Jl '64. (MIRA 18:3)

1. Otdel klinicheskoy gematologii (zav. - prof. D.N. Yanovskiy)  
Ukrainskogo nauchno-issledovatel'skogo instituta klinicheskoy  
meditsiny imeni Strazhesko (dir. - prof. A.L. Mikheev), Kiev.

KARPENKO, L.D.

Study of the leucolyzing property of blood serum in leucopenic conditions. Vrach. delo no.12:88-93 D '61. (MIRA 15:1)

1. Otdel klinicheskoy gematologii (zaveduyushchiy - prof. D.N. Yanovskiy) Ukrainskogo nauchno-issledovatel'skogo instituta klinicheskoy meditsiny im. akademika N.D.Strazhesko.  
(LEUCOPENIA) (SERUM)

KARPENKO, L.D.

Study of leucopenic states in the light of immunogenesis.  
Sov. med. 27 no.12:15-22 D'63 (MIRA 17:4)

1. Iz otdela klinicheskoy gematologii ( zav. - prof. D.N.  
Yanovskiy) Ukrainskogo nauchno-issledovatel'skogo instituta  
klinicheskoy meditsiny imeni N.D. Strazhesko (dir. - zaslu-  
zhennyy deyatel' nauki prof. A.L.Mikhnev).



KARPENKO, L.D. (Kiyev)

Antileucocytic antibodies in leucopenic conditions. Vrach.delo  
no.1243-47 Ja '63. (MIRA 16:2)

1. Otdel klinicheskoy gematologii (zav. - prof. D.N. Yanovskiy)  
Ukrainskogo nauchno-issledovatel'skogo instituta klinicheskoy  
meditsiny imeni akademika N.D. Strazhesko.  
(LEUCOPENIA) (ANTIGENS AND ANTIBODIES)

ALINOV, A.G., inzh.; KARPENKO, L.G., inzh.; TAPASOVA, L.P., inzh.;  
TIKHOMIROVA, K.A., inzh.; BERILOV, N.T., inzh.; YUDIN, V F.,  
inzh.; SOBINOVA, L.I., inzh.; TRUSKO, A.A., inzh.

Rapid bottom pouring of killed steel. Stal' 25 no.3;  
230-231 Mr '65. (MIRA 18:4)

L 12776-63  
ACCESSION NR: AP3001525

EWT(1)/EWP(q)/EWT(m)/BDS

AFFTC/ASD/SSD

Pi-4

RDW/JD/JG/IJP(C)

S/0032/63/029/006/0683/0683

AUTHOR: Zakhariya, N. F.; Turulina, O. P.; Karpenko, L. I.; Voloschenko, I. A.TITLE: Application of sulfidizers in spectral analysisSOURCE: Zavodskaya laboratoriya, v. 29, no. 6, 1963, 683

TOPIC TAGS: active carrier, sulfidizer, spectral analysis, sulfur, bismuth sulfide, antimony sulfide, silicon

ABSTRACT: The purpose of the present investigation was to find a way to promote vaporization in a carbon arc of certain impurities or admixtures in minerals and ores, to be determined by spectral analysis. Sulfidizers, such as elementary sulfur, bismuth sulfide, and antimony sulfide, were found to be effective in promoting the volatilization of silicon, zirconium, selenium, tellurium, and germanium, presumably by converting their oxides (which have a high vaporization temperature) to sulfides which would volatilize at 700C, as is the case with selenium and tellurium. In selecting the proper sulfidizing agent it is essential that its dissociation temperature be above that of the derived sulfides and that it should not form a melt with the material under test. When necessary, aluminum oxide and zirconium oxide were added to the sample to render it less fusible. The paper was presented at the conference on spectroscopy, which took place

1/A

*Instr. of Gen & Inorganic Chemistry*

KARPENKO, L. I.

KARPENKO, L. I.: "INVESTIGATION OF THE DIAGRAMS OF COMPOSITION AND REFRACTORY QUALITY OF CERTAIN COPPER SYSTEMS AT VARIOUS TEMPERATURES." MIN HIGHER EDUCATION USSR. MOSCOW INST OF NONFERROUS METALS AND GOLD IMENI M. I. KALININ. CHAIR OF METAL SCIENCE. MOSCOW, 1956.  
(DISSERTATION FOR THE DEGREE OF CANDIDATE IN TECHNICAL SCIENCES).

SO: KNIZHNAYA LETOPIS', No 23, 1956

SOV/136/58-8-15/27

AUTHORS: Zakharov, M.V., Karpenko, L.I. and Stepanova, M.V.

TITLE: Relation Between the Tensile Strength and Hardness for Some Copper Alloys at High Temperatures (Sootnosheniye mezhdu predelom prochnosti na razryv i tverdost'yu dlya nekotorykh mednykh splavov pri vysokikh temperaturakh).

PERIODICAL: Tsvetnyye Metally, 1958, Nr.8, pp.64-67 (USSR)

ABSTRACT: Hardness determination can form a rapid method of evaluating the short-term tensile strength of metals and alloys if the relation between the two is known. Although linear relations have been found for some ferrous alloys (Refs.5,6) the data for non-ferrous alloys is insufficient. The authors have studied these relations for binary (Cu-Al, Cu-Mn, Cu-Cr, Cu-Zr), ternary (Cu-Ni<sub>2</sub>S, Cu-NiAl, Cu-Cr-Zr, Cu-Ni-Be) and quaternary (Cu-Ni-Be-Zr, Cu-Ni-Be-Cd) copper alloys at 600 and 800°C. Altogether 70 alloys were made from electrolytic copper and the appropriate alloys. All alloys were predeformed in the hot state to 50%. Some were binary and ternary alloys tested in the annealed state (annealing at 800°C for 50-70

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SOV/136-58-8-15/27

Relation Between the Tensile Strength and Hardness for Some Copper Alloys at High Temperatures.

hours); others ternary and quaternary in the heat-hardened state (quenching from 1000°C into cold water followed by 5 hours tempering at 475°C). A 2-ton Amsler press with a loading rate of 20 mm/min. was used for tensile tests, hardness being determined by indentation of a 5-mm radius hemisphere for 30 seconds and all test pieces being heated for 15 minutes in a furnace at the test temperature and soaked for 5 minutes. The results for binary alloys at 800°C (Table 1), for Zr-Cr-Zr alloys at 600 and 800°C (Table 2 and Fig.1) and for Cu-Ni-Be, Cu-Ni-Be-Zr and Cu-Ni-Be-Cd at 600 and 800°C (Table 3 and Fig.2) show a satisfactorily linear hardness vs strength relation, and hot hardness tests are recommended as a first evaluation of hot strength. The compositions of the alloys are given in the tables.

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SOV/136-58-8-15/27

Relation Between the Tensile Strength and Hardness for Some Copper Alloys at High Temperatures.

There are 2 figures, 3 tables and 6 references, 4 of which are Soviet and 2 English.

1. Copper alloys--Mechanical properties    2. Copper alloys--Temperature factors    3. Copper alloys--Test results

Card 3/3

AUTHORS: Zakharov, M.V. and Karpenko, L.I. (Moscow) SOV/24-58-9-5/31

TITLE: Composition-heat Resistance Diagrams at Homologous Temperatures (Diagrammy sostav - zharoprochnost' pri sootvetstvennykh temperaturakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 9, pp 31 - 36 (USSR)

ABSTRACT: The effect of the composition of alloys on their heat resistance is usually studied isothermally, at temperatures of practical interest. More useful data about the basic properties of alloys can be obtained if investigations of this type are carried out at homologous temperatures, i.e. at such temperatures  $T$  that the ratio  $T/T_M$  (where  $T_M$  = melting point of the alloy) is the same for the whole range of investigated alloys of a given system. In the present investigation, the copper-rich alloys of the following binary and pseudo-binary systems were studied: Cu-Zn, Cu-Al, Cu-Sn, Cu-Sb, Cu-Zr, Cu-Ni<sub>2</sub>Si and Cu-NiAl.

All the test pieces prepared from both cast and hot-rolled materials were subjected to a long (70-100 hrs) annealing treatment at 600 - 850 °C (depending on the composition

Card1/4



SOV/24-58-9-5/31

## Composition-heat Resistance Diagrams at Homologous Temperatures

of the alloy). The heat resistance of the alloys was determined by means of hardness measurements taken in air, at homologous temperatures  $T = 0.6 - 0.9 T_M$ , with the load applied for 60 min. After the completion of the test, each test piece was quenched from the test temperature so that the structure of the alloys at the test temperature could be determined by microscopic examination. The results are reproduced graphically in the form of the high-temperature hardness/composition curves, superimposed on the appropriate portions of the equilibrium diagrams of the investigated systems (Figures 1-7). The curves (whose shape depended on factors such as the extent of the solid solubility range, variation of the solid solubility limit with temperature, presence or absence of intermediate phases or intermetallic compounds) can be divided into four groups: to the first of these groups belong curves with the maximum high-temperature hardness at  $T = 0.6 - 0.8 T_M$  shifted from the solid solubility limit towards the solvent metal, i.e. situated in the region of dilute solid solutions (systems Cu-Zn, Cu-Al). In systems of this type, there is a wide solid

Card2/4

SOV/24-58-9-5/31

Composition-heat Resistance Diagrams at Homologous Temperatures

solubility range (18-38 atm%) and the phases of these systems become very ductile at  $T = 0.7-0.8 T_M$ .

Diagrams with the maximum high-temperature hardness at  $T = 0.7 - 0.9 T_M$  situated at, or near, the solid solubility limit of the  $\beta$ -phase constitute the second group (systems Cu-Sn, Cu-Sb). Systems of this type are characterised by a narrow solid solubility range (5-8 atm%) and at  $T = 0.7 T_M$  the strength of the  $\alpha$  and  $\beta$ -phases is almost the same.

In the diagrams of the third group, hardness of the alloys at  $T = 0.6 - 0.8 T_M$  increases gradually as the content of the solute atoms increases (systems Cu-Cr, Cu-Zr). The solid solubility range in systems of this type is very narrow (a fraction of atm%) and the  $\beta$ -phase is characterised by high strength at elevated temperatures. Diagrams with the maximum high temperature hardness at  $T = 0.6-0.8 T$  situated in the two-phase region constitute the fourth group (systems Cu-Ni<sub>2</sub>Si, Cu-NiAl). The sudden increase

Card3/4 of the heat resistance of the two-phase alloys of these

SOV/24-58-9-5/31

Composition-heat Resistance Diagrams at Homologous Temperatures

systems is associated with the appearance of highly refractory phases which usually consist of the solute elements only. In systems of this type, the solid solubility often increases with the rising temperature and the resulting solution-precipitation and recrystallisation processes may cause reduction of the strength of the two-phase alloys. For this reason, the maxima on the heat resistance composition curves for the cast and plastically deformed alloys do not coincide. In the latter case, the maximum is more sharply pronounced and is situated nearer the Cu end of the equilibrium diagram. There are 7 figures and 6 Soviet references.

SUBMITTED: June 8, 1978

Card 4/4

SOV/137-59-5-11023

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 5, p 221 (USSR)

AUTHORS: Zakharov, M.V., Karpenko, L.I.

TITLE: Composition Heat Resistance Diagrams<sup>6</sup> of Alloys at Corresponding Temperatures

PERIODICAL: Sb. nauchn. tr. Nauchno-tekhn. o-vo tsvetn. metallurgii, Mosk, in-t tsvetn. met. i zolota, 1958, Nr 29, pp 93 - 100 ✓

ABSTRACT: The article has not been reviewed.

Card 1/1

ZAKHARIYA, N.F.; TURULINA, O.P.; KARPENKO, L.I.; VOLOSHCHENKO, I.A.

Use of sulfidizers in spectral analysis. Lav. lab. 29 no.6:  
683 '63. (MIRA 16:6)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR,  
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(Spectral analysis) (Sulfuration)

ACCESSION NR: AT4001240

8/3031/63/000/035/0233/0238

AUTHORS: Zakharov, M. V.; Stepanova, M. V.; Karpenko, L. I.; Gorklenko, N. P.; Mogilevskaya, V. Ye.

TITLE: Effect of composition on recrystallization temperature and heat resistance of copper alloys

SOURCE: Gosudarstvennyy institut tsvetnykh metallov. Sbornik nauchnykh trudov. Moscow, no. 35, 1963, 233-238.

TOPIC TAGS: heat resistance, recrystallization temperature, copper chromium alloy, copper iron alloy, copper chromium zirconium alloy, copper nickel beryllium alloy, copper nickel aluminum alloy, copper nickel, silicon alloy

ABSTRACT: To check on the hypothesis that heat resistant alloys have high temperature recrystallization levels, exceeding their working temperatures, as is the case for Cu-Sn and Cu-Zn alloys (M. V. Zakharov, Collection Issledovaniye splavov tsvetnykh metallov (Investigation of Nonferrous Alloys, AN SSSR, 1955), the authors compared the dependence of the start-of-recrystallization temperature

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ACCESSION NR: AT4001240

and the heat resistance on the composition of copper alloys, and established the presence of such a dependence in the systems Cu-Cr, Cu-Fe, Cu-Cr-Zr, Cu-Ni-Be, Cu-Ni-Al, and Cu-Ni-Si. The temperature of the start of the recrystallization increases with increasing concentration of the alloying elements in the solid-solution region, reaches a flat maximum in the two-phase region, and then again decreases smoothly. The curves of the start-of-recrystallization temperature and the long-term hardness against the composition are similar in first approximation, if the long-term hardness is determined at temperatures that exceed the temperature of the start of recrystallization. The maximum heat resistance and the minimum temperature of the start of recrystallization lie in the region of weakly-heterogeneous aging alloys. The close connection between the heat resistance of an alloy and recrystallization is fully confirmed by the experimental data obtained. Orig. art. has: 7 figures.

ASSOCIATION: Gosudarstvennyy institut tsvetnykh metallov (State Institute of Nonferrous Metals)

Card 2/72

L 45333-66 EWT(m)/EMP(t)/EII IJE(c) JD/JG

ACC NR: AP6024290

SOURCE CODE: UR/0075/66/021/007/0864/0867

AUTHOR: Karpenko, L. I.; Fadeyeva, L. A.; Beltyukova, S. V.

ORG: Institute of General and Inorganic Chemistry, AN UkrSSR, Laboratories in Odessa (Institut obshchey i neorganicheskoy khimii AN UkrSSR, Laboratorii v Odessa)

TITLE: Spark method for spectrographic determination of rare earths in solution

SOURCE: Zhurnal analiticheskoy khimii, v. 21, no. 7, 1966, 864-867

TOPIC TAGS: spectrographic analysis, chromatography, rare earth

ABSTRACT: A spectrographic method has been suggested for the direct analysis of solutions obtained during chromatographic separation of rare earths. A high-voltage condensed spark is used as an excitation source. The method permits the determination of Eu, Gd, Tb, Dy, Ho, Er, Tu, Yb, Lu, and Y in solution with a sensitivity of hundredths and thousandths parts of one milligram in 1 milliliter.

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UDC: 543.42